Abstract Submitted
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Linear waves in two-layer fluids over periodic bottoms[1] JIE YU, Department of Civil Engineering, and School of Marine and Atmospheric Sciences, Stony Brook University, USA, LEO MAAS, Royal Netherlands Institute for Sea Research, and Institute for Marine and Atmospheric Research Utrecht, Utrecht University — A new, exact Floquet theory is presented for linear waves in two-layer fluids over a periodic bottom of arbitrary shape and amplitude. A method of conformal transformation is adapted. The solutions are given, in essentially analytical form, for the dispersion relation between wave frequency and generalized wavenumber (Floquet exponent), and for the waveforms of free wave modes. The dispersion relation is the analogue of the classical Lamb's equation for a two-layer fluid over a flat bottom. For internal modes the interfacial wave shows rapid modulation at the scale of its own wavelength that is comparable to bottom wavelength, whereas for surface modes it becomes a long wave carrier for modulating short waves of bottom wavelength. The approximation using a rigid-lid is given. Sample calculations are shown, including the frequencies that are Bragg resonant.

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Jie Yu
Department of Civil Engineering, and School of Marine and
Atmospheric Sciences, Stony Brook University

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